

What is Claimed is:

1. A sidestream gas sampling system, comprising:
  - a conduit adapted to communicate a flow of gas to a gas measurement site;
  - a gas measurement assembly adapted to measure a constituent of the flow of gas at the gas measurement site;
  - a capillary tube adapted to communicate the flow of gas from the gas measurement site;
  - a differential pressure transducer in fluid communication with a first portion and a second portion of the capillary tube, wherein the first portion and the second portion are spaced sufficiently far apart from one another such that a pressure differential exists therebetween;
  - flow generating means for generating the flow of gas; and
  - a controller operatively coupled to the differential pressure transducer and the fluid transferring means, wherein the controller measures the flow of gas based on the output of the differential pressure transducer and controls the flow of gas via the flow generating means based on the measured flow.
2. The system of claim 1, wherein the flow generating means is a pump.
3. The system of claim 1, wherein first portion is an inlet portion of the capillary tube and the second portion is an outlet portion of the capillary tube.
4. The system of claim 1, wherein the capillary tube includes at least one bend.
5. The system of claim 1, wherein the gas measurement assembly includes an emitter adapted to emit radiant energy through the gas at the gas measurement site and a detector adapted to receive the radiant energy passing through the gas at the gas measurement site.

6. The system of claim 1, wherein the controller controls the flow generating means in a feedback fashion such that the flow of gas remains constant.

7. The system of claim 1, wherein the capillary tube communicates the flow of gas from the gas measurement site to ambient atmosphere.

8. The system of claim 1, wherein the capillary tube communicates the flow of gas from the gas measurement site to the flow generating means.

9. The system of claim 1, further comprising a sample cell having an inlet operatively coupled to an end of the conduit to receive gas from the conduit and an outlet operatively coupled to the capillary tube, wherein the sample cell defines the gas measurement site.

10. The system of claim 9, wherein the sample cell is detachable from a housing containing the gas measurement assembly, the capillary tube, the flow generating means, and the controller.

11. A sidestream gas sampling system, comprising:  
gas communicating means for communicating a flow of gas to a gas measurement site;  
gas measuring means for measuring a constituent of the flow of gas at the gas measurement site;  
flow sensing means for measuring the flow of gas in the gas communicating means substantially independent of a density of the flow of gas;  
flow generating means for generating the flow of gas; and  
controlling means, operatively coupled to the flow sensing means and the flow generating means, for controlling the gas flow generating means based on an output of the flow sensing means.

12. The sidestream gas sampling system of claim 11, wherein the flow generating means is a pump.

13. The sidestream gas sampling system of claim 11, wherein the flow sensing means is a differential pressure transducer in fluid communication with a first portion and a second portion of a capillary tube.

14. The sidestream gas sampling system of claim 13, wherein first portion is an inlet portion of the capillary tube and the second portion is an outlet portion of the capillary tube.

15. The sidestream gas sampling system of claim 13, wherein the capillary tube includes at least one bend.

16. The sidestream gas sampling system of claim 13, wherein the capillary tube communicates the flow of gas from the gas measurement site to ambient atmosphere.

17. The sidestream gas sampling system of claim 13, wherein the capillary tube communicates the flow of gas from the gas measurement site to the flow generating means.

18. The sidestream gas sampling system of claim 13, wherein the controlling means is operatively coupled to the differential pressure transducer and the flow generating means to control the flow generating means based on an output of the differential pressure transducer.

19. The sidestream gas sampling system of claim 19, wherein the controlling means controls the flow generating means such that a rate of the flow of gas remains constant.

20. The sidestream gas sampling system of claim 11, wherein the gas measuring means includes:

radiant energy emitting means for emitting radiant energy through gas at the gas measurement site; and

detecting means for receiving the radiant energy passing through the gas at the gas measurement site.

21. A method of sidestream respiratory gas analysis, comprising:  
communicating a flow of gas to a gas measurement site;  
measuring a constituent of the flow of gas at the gas measurement site;  
communicating the flow of gas from the gas measurement site via a capillary tube, wherein a first portion of the capillary tube and a second portion of the capillary tube are spaced sufficiently far apart from one another such that a pressure differential exists therebetween;

measuring the pressure differential with a differential pressure transducer in fluid communication with the first portion and the second portion of the capillary tube;  
and

controlling the flow of gas based on an output of the differential pressure transducer.

22. The method of claim 21, wherein controlling the flow of gas is accomplished in a feedback fashion such that the flow of gas remains constant.